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SECURITY INFORMATION

REPORT NO.

50X1

COUNTRY USSR (Molotovskaya Oblast)

DATE DISTR. 30 Oct. 53

SUBJECT Coal Mine No. 6, Kizel

NO. OF PAGES 17

50X1 PLACE
ACQUIRED

NO. OF ENCLS. 6
(LISTED BELOW)

50X1 DATE
ACQUIRED BY SOURCE

SUPPLEMENT TO
REPORT NO.

DATE OF INFORMATION

THIS IS UNEVALUATED INFORMATION

SOURCE

50X1

1. The area around Kizel N 59-03, E 57-40 was rich in anthracite coal of an excellent quality. Several dozen anthracite coal mines had been opened near Kizel beginning in 1933. I heard in Kizel that the pioneers in this area had been Ukrainian farmers who were resettled in the Ural region in 1933 in punishment for their opposition to the organization of kolkhozy.
- a. I do not know exactly what the term anthracite meant in the USSR. In general, the term was applied to stone coal of the highest quality. The coal mined in Mine No. 6 was always referred to as anthracite; it had a deep black color with a shiny, metallic surface. This coal would break quite easily, always in layers, and always revealed silvery, flat surfaces.
- 50X1 b. On several occasions I heard that this coal, or at least part of it, was used for cooking purposes. I remember being told that, when burning, it developed a temperature of approximately 8,000 calories. (Later I learned that in the USSR
- 50X1 anthracite was mined in the Donets Coal Basin, western Siberia, and on the western slopes of the Ural Mountains.)
2. Kizel Coal Mine No. 6 (Kizel Ugol' Shakhta No. 6), Annex A7, was located four to five kilometers northeast of Kizel. As far as I know, operations began in 1940. According to results of geological research, this mine was composed of six beds of anthracite coal, each from two to six meters thick. During the period 1944-1946,

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CONFIDENTIAL

-2-

50X1

only the first bed, which was 400 m. under the surface, and the second one, which was 450 m. deep, were in operation. The third bed, located 490 to 500 m. under the surface, was in preparation at that time; at the same time, expansion of the mining area was being continued on the first and second beds. Nothing was done on beds four to six until 1946.

3. [] the first bed; therefore, I can describe only the organization of work as it was done there. (I assume, though, that the same system was used on the second bed.) Two main, electrically operated elevators (capacity of five tone each) led down to the mine; a third elevator was used for miners only. Loading areas at the main coal shafts on the level of the first bed were approximately 300 x 300 m. and the coal was brought to the elevators by electric trains of 50 to 60 dump cars (capacity of one ton each). The railroad gauge was .75 m. A main gallery, approximately six to seven kilometers long, led off north and south from coal shafts. This gallery was constructed like a concrete vault five meters wide and 2½ m. high. Auxiliary galleries branched out from the main one in the form of a chess board with the squares 500 m. x 500 m. The auxiliary galleries were supported by pillars and were completely covered on the sides and top with lumber about 20 cm. in diameter. Auxiliary galleries were two meters wide and three to four meters high. Double-track rail lines were laid in the main gallery. There were also, on both sides of the main gallery, sidetracks for parking loaded and unloaded cars which were awaiting transport to and from cross galleries. Every second cross gallery had a single track of .75 m. for transporting props, explosives, machinery, etc. No electric locomotives were used in these galleries. The cars were pulled from the main gallery by electric winch lorries located at the end of each cross gallery provided with single-track rail lines. Empty cars were returned to the main gallery by the simple release of a winch rope. This was possible because of a natural drop from the cross gallery to the main one. The entire operation of pulling and releasing cars was conducted by push buttons. The remaining cross galleries, located between those provided with rail tracks, had conveyor belts running to the main gallery. Coal was automatically released from the conveyers into cars parked on the main gallery sidetracks; the cars were then taken by electric locomotives to the main track and pulled to the closest elevator shaft Annex E.

4. Mining always began at the far end of the gallery in order to keep the gallery free for transport as long as possible. Prior to mining operations, the coal face was opened by removing lumber covering the gallery wall. A stretch no longer than 50 m., the normal working face (lava), was uncovered since danger of a cave-in became too great when faces were longer. This, however, depended on local conditions, character of the coal, composition of the coal bed, and position of the working room. When the working area was not located at the end of the gallery or future extension of the gallery was planned, mining was done in a new, parallel gallery 10 m. away. The coal between the two galleries, 10 m. thick, was left untouched and mining was done on the far side of the new gallery. The working area was always protected by props 20 to 60 cm. in diameter. Rows of these props were placed every meter with the props themselves one meter apart.
5. An 80 cm. passage was left between the coal face and the first row of props to allow room for mining; two meter-long electric shakers (reshtak) were placed behind the first row of props in links of 20. One electric motor could operate the whole link. At times the shakers stretched to a length of 500 m., in which case they were operated by 10 or more motors. Shakers were lifted approximately 60 to 80 cm. from the gallery floor and were secured in this position by chains fastened to the props. See Annex F. When the coal

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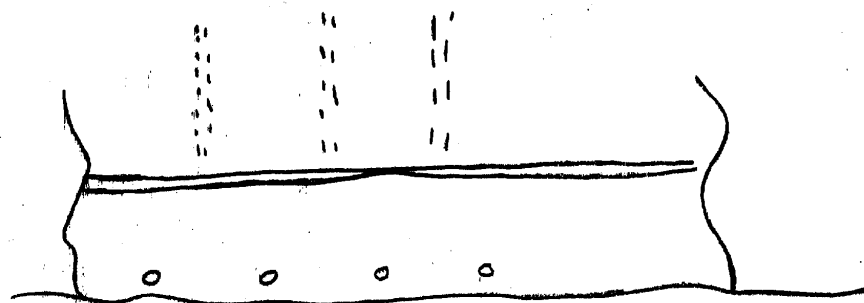
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50X1

-3-

layer was no higher than four meters horizontal cutting of the coal face was done by electric cutters normally 1.2 m. from the bottom of the coal face. This resulted in a two meter-deep cut along the 50 m.-stretch. Coal cutters were never removed from the gallery during drilling, shooting, and loading operations. This was unnecessary since, upon completion of shooting, the cutter was already at least 10 to 15 m. away cutting the next coal face. See Annex C, Pt. 1.

6. During the process of cutting, the shakers, which were loaded by hand, removed coal broken from the face and transported it to the closest conveyer line in the gallery. From there it was taken to the main gallery, loaded on coal cars, and hauled to the main shaft. Conveyers bringing coal to the main galleries discharged it directly into cars which were placed below the conveyer belt for this purpose. There was no limit to the number of conveyer discharge points (car loading points) which might be in operation at any one time. Normally one locomotive for the maneuvering of cars was assigned to a section of mine, referred to as uchastok, which comprised that part of the mine located between two parallel one-track galleries and the main gallery. See two shaded squares of Annex B. This maneuvering did not affect the movement of trains in the main gallery, which had double-track line. I believe that, on the whole, there were about two dozen electric trolley locomotives in Mine No. 6. I am quite sure that there were no battery locomotives and I know that all trolley locomotives were of the same standard Soviet make.
7. When the space between the last row of props and the coal face was cleared, drilling began. Drilling was done with electric drills 32 mm. in diameter, the heads of which were made of pobedit steel. Drills of the following lengths were used in the mine: 0.5, 1, 1½, 3, and 3½ m. A pobedit drill ordinarily lasted for five meters of drilling. Drilling was usually done on two levels. For the lower level, horizontal shafts were made at the bottom of the gallery, leaving approximately 1.2 m. between shafts. Upper-level drilling was done close to the cut, with approximately 1 to 1.2 m. between shafts, but here drilling was done at a 45° angle upward as shown below:



The shafts in the lower and upper levels were interspaced alternately. It was possible to have 80 to 100 shafts on a coal face 50 m. long. Ammonite, which came in packages of 200 g., was used as an explosive charge. The normal charge for a single shaft was 600 to 800 g. All 80 to 100 shafts were provided with explosive charges and blown simultaneously. Prior to the blasting, all miners were taken from the gallery.

CONFIDENTIAL

CONFIDENTIAL

50X1

-4-

8. Immediately after the explosion, which usually broke a layer of coal from 2 to 2.5 m. thick, the shaker, as a rule partially buried under the coal broken from the face, began removing and transporting it to the gallery, as described above Paragraph 5. The shakers fed coal into a semi-trough-type belt conveyer, which in turn, fed it into cars placed on the sidetracks of the main galleries. The conveyer was approximately 80 cm. wide and could be several kilometers long; the belt was made of a fiber material covered with a rubberized compound. I do not know exactly how many rooms could be served simultaneously by a conveyer. I do not believe, however, that this number could be more than four. Otherwise, there would be too much coal and it would fall from the conveyer.
9. Electrically operated scraper transporters (skreper rukoyatnyy), also called skrebkovyy transporter provided with small conveyer belts of fiber rubber thread were used to pick up coal and bring it to the shaker. The scraper transporter used in Mine No. 6 was a self-loading type which was attached to a special sleigh and which could be turned in any direction desired. The scrapers were provided with electric motors of from two to three kilowatts which generated power for the roller, used for picking up coal lumps, and for the conveyer belt, where the coal was placed by the roller for transporting to the nearest shaker. A shaker transporter was 1.5 m. long, .75 m. wide, and .8 m. high. The motor was connected by a special gear, with the roller which was equipped with approximately 12 rows of scrapers. See Annex E for top view and other details. The scraper had two handles which could be switched from one side to the other so that it could be operated in any direction.
10. The final clearing of the debris was done by hand with spades. However, the whole process of removing the coal, after it had been placed on the shaker, was automatic. It was automatically taken to the cross gallery conveyer, taken by conveyer to the main gallery, automatically loaded into coal cars and taken to the elevator shaft. During the process of removing the coal, when there was available space, new rows of props, at one meter's distance, were put all the way up to the new coal face.
11. The procedure, described above, of working on a 50 m. stretch of coal face was continued farther up the 500 m. length, referred to as a "cycle" (tsikl). (The approximate length of time needed to mine a cycle was 72 hours.) The shakers were not moved until the whole 500 m. was cut and blown in sections of about 50 m., at which time the link of shaker conveyers moved closer to the new face. Five hours (30 minutes for every 40 to 50 m.) was required to move all the shakers working on a 500 m. face. (The most time-consuming work was the removal and fastening of shaker motors.) However, since work on every cycle started at the beginning of the face, it was unnecessary to move the complete line of shakers to start a new cycle; mining could start when one shaker link of 40 to 50 m. had been moved. Later, subsequent links were moved close to the new face until all the shakers, covering 500 m., were placed, link by link, in a new position before the new coal face. Usually, only one shaker section, made up of one motor and 20 to 24 shakers, (10 or 12 shakers attached to the motor on one side and 10 or 12 on the other) each two meters long, was moved at one time. A section like this was normally 42 to 50 m. long. The same process was then repeated three or four times while new rows of props were constantly being put in.
12. After three or four vertical layers of coal 2-2½ m. thick had been removed, it was necessary to discontinue work because of pressure from the top. Then a solid row of pillars, resembling a wall, see Sketch below was put parallel to the new coal face 80 cm. away; all other props in the coal room were charged with explosives and blasted, at which time the top collapsed and the room became clogged. The passage between the pillar wall and the new coal face

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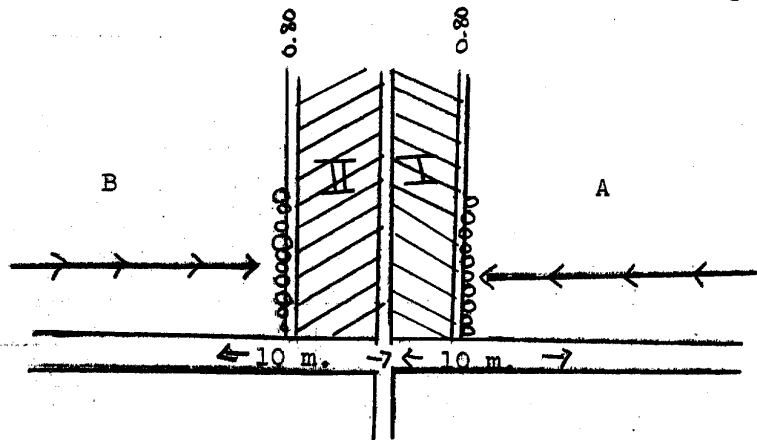
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50X1

-5-

remained untouched and mining began from the passage in the way described above. The old props were never retrieved; they were destroyed when the places were blasted. Worked-out areas were always covered as described here; no waste material was ever brought in to fill these places.

13. Mining continued only until the thickness of the coal layer separating the next parallel gallery was reduced to 10 m., as shown below, since further work would have endangered the next gallery.



(A and B above are the two working areas; I and II are two 10-m. layers of coal.)

Then another coal block would be started in a new gallery and the coal layer, 10 m. thick, would be left between the blocks.

14. A crew working on one coal face in Mine No. 6 was normally made up of the following members:
- One face leader, referred to as desyatnik or nachal'nik lavy.
 - One assistant leader, referred to as brigadier; he usually worked as loader (naval'shchik).
 - One cutting machine operator (vrub mashinist).
 - One assistant cutting machine operator.
 - Two drillers (buril'shchiki).
 - One man to handle detonations (vzryval'shchik).
 - Two or three mechanics (slesar') for emergency repair of winches, shakers, motors, etc.
 - One man (elektroslesar') for emergency repair of all electro-motors and electrical equipment.
 - Ten machine operators (mashinist), usually women; approximately six for shaker motors (one for each), two for winches, and two for conveyer motors.
 - Four prop-transport workers (lesovezy).
 - Six to eight prop setters (krepil'shchiki).

CONFIDENTIAL

CONFIDENTIAL

50X1

-6-

1. Fifteen to 25 loaders referred to as naval'shchiki. To this group belonged coal loaders, shaker-movers, and scraper-transporter operators. The jobs were not specifically assigned, however; each of the crew members could be shifted to fill existing needs. There were usually five or six scraper-transporters assigned to each face; other crew members shoveled coal by hand and a third group moved the shakers closer to the new coal face when this was required. In cases when there were only 15 naval'shchiki, only 5 or 6 would load by hand. However, when there were as many as 25, loading by hand would be done by 10 or 12.
15. When the coal bed was more than four meters high and the lower part of the bed had been removed, the upper part was eventually broken into small sections (2 to 3 m. wide and 15 to 20 m. long). Supporting props and coal blocks were blown simultaneously. Various improvised ways of transporting the coal using scraper-transporters, temporary railroad lines, electric winch lorries, and manual labor were used in such cases.
16. Water pump stations, transformers, ventilation rooms, the dispensary, and storage room for explosives, machinery, and spare parts were located at the main coal shaft transloading stations. See Annex B. I know that, at any time, there were, at least, around 20,000 kg. of explosives stocked at each main coal shaft.
17. Transloading of the coal was done automatically; the coal was released from the dump cars into elevators of five tons' lifting capacity (five dump cars). The round trip of the elevator from a depth of 400 m. usually took 1½ minutes. On the surface the coal was dumped into an intermediary hopper (promezhutochnyy bunker) of 10 tn. capacity from where it was taken immediately, by conveyor belt, to permanent bunkers located approximately 100 m. from the hopper. From here the coal was loaded onto freight cars through bunker shafts. Usually, there was no delay and as soon as there was sufficient coal in the bunker it was taken away.
18. Kizel Coal Mine No. 6 had its own electric power plant with a capacity of several thousand kilowatts. All galleries were provided with electric lights and all machinery, including the underground railroad lines, was operated electrically. Each miner was equipped with a battery electric lamp, of 24 hours' capacity, fastened to the front of his helmet. Ventilation pipes led from each gallery to the surface; the main pipes, of 40 cm. diameter, were laid down the two main shafts and proceeded along the main galleries. Auxiliary galleries were provided with ventilation pipes of 25 to 30 cm. diameter. Fans were installed in the pipes to drive fresh air, the flow of which could be regulated. The stale air was removed by special intake ventilation pipes also provided with fans. The regulation of underground ventilation was the responsibility of a special detachment of approximately 100 men.
19. Usually, one cutting machine was used on a coal face 500 m. in length. From 1½ to 2 hours were needed to make a cut two meters deep and 15 to 20 cm. wide in a 50 m. face. When this cut had been made it was necessary to replace a number of bits. (The cutting tools on a coal cutter were referred to as bits, zubtsy or zubtsy vrubovoy mashiny.) The old bits were sent to maintenance shops, where they were overhauled. Hand picks were generally used for breaking the coal. However, depending on local conditions, pneumatic picks, which could be used for from 8 to 16 hours prior to overhauling, were used. Drills, in which the condensers burned out after several hours, were the only equipment which had to be replaced often. The life of a shaker motor was approximately

CONFIDENTIAL

CONFIDENTIAL

-7-

50X1

30 working days. I am in no position to give models and numbers of equipment used in the mine. The cutters, of which there were possibly several dozen, were of the same make and model. They were definitely of Soviet manufacture, as was all equipment in Mine No. 6. Although no new machinery arrived from 1944 to 1946, the [redacted] several motors for shakers and scraper-transporters, of the same make as previous ones, were received. The maintenance of all mechanical equipment was done at the mine's repair shop on the surface. Repairs took only a few days. As far as I noticed, all the machinery used in Mine No. 6 was in good condition with the exception of certain electric locomotives which were scheduled for replacement in 1947.

20. Shakhtostroy (Mine Construction Administration of the Ministry of the Coal Industry) was responsible for the driving of entries and the opening of work rooms in the mine. This work, which involved drilling, blowing, cleaning, and constructing cement-vaulted and lumber-covered galleries, was carefully done. No cutting machines were used. Each crew for entry driving was usually composed of five members referred to as prokhodchiki. In an eight-hour shift they could drive from 6 to 10 ft. into the coal face. When there was stone, the drive was usually reduced to three or four feet. The work was done in three shifts. Rocks and waste material were removed from entries and taken to the surface. See Annex A, Pt. 13.
21. The quantity of coal broken per pound of explosives in Mine No. 6 was approximately 160 to 200 lbs. It was unnecessary to clean the coal above ground since it was not mixed with stone; nor was it sized prior to shipping. I do not know to what place it was shipped, but I have heard that there were several plants close to Kizel where our anthracite was coked. I have no further information on this subject.
22. The 24-hour production norm for Kizel Coal Mine No. 6 was 1,200 tn. As far as I know, this norm was always met.
23. The mine employed 6,000 workers in three eight-hour shifts. Of this number, only 1,500, or 500 per shift, were miners; the remaining 4,500 were Shakhtostroy workers, some of whom could be used as miners, however, if necessary. One thousand five hundred inmates of (then) NKVD Screening Camp No. 2 worked as miners and Shakhtostroy workers.
24. The average monthly wage of an independent miner who worked eight hours a day six days a week was approximately 1,500 rubles. Machine operators who over-fulfilled their norms made up to 5,000 rubles. Drillers made up to 3,000 rubles. Camp inmates received only 100 rubles monthly but received additional food coupons for over-fulfilled norms.
25. Safety regulations were followed quite satisfactorily in the mine. Though the work, by nature, was dangerous, there were no major accidents throughout the 2½ years [redacted]. Minor accidents where one or several miners were injured, always resulted in careful investigation and punishment of the responsible supervisor who had neglected to take adequate measures to prevent such accidents.

Annexes:

- A. Surface Plan of Coal Mine No. 6, Kizel
- B. Underground Plan of Coal Mine No. 6, in Kizel
- C. Plan of a Coal Block (Lava) in Operation

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-8-

50X1

D. Coal Cutter and Electric Drill

E. Scraper-Transporter

F. Shaker

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Surface Plan of Coal
Mine No. 6, Kizel

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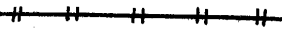
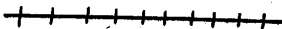
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50X1

-10-

ANNEX A (Cont'd):

LEGEND

- Pt. 1. Administration building, offices, warehouses, storerooms, showers, etc.
2. Main electric winch lorry machine room.
3. Electric power plant and transformer area.
4. Repair and maintenance shops (shops for repair of mechanical and electrical equipment, forge, carpentry, and other).
5. Elevator for miners.
6. Coal elevators.
7. Hoppers.
8. Permanent bunkers.
9.  Normal gauge railroad lines.
10.  Narrow gauge (75 cm.) railroad lines.
11. Room for ventilating machinery.
12. Water pump station.
13. Shakhtostroy stone dump (rocks and earth removed from the entries were dumped here).

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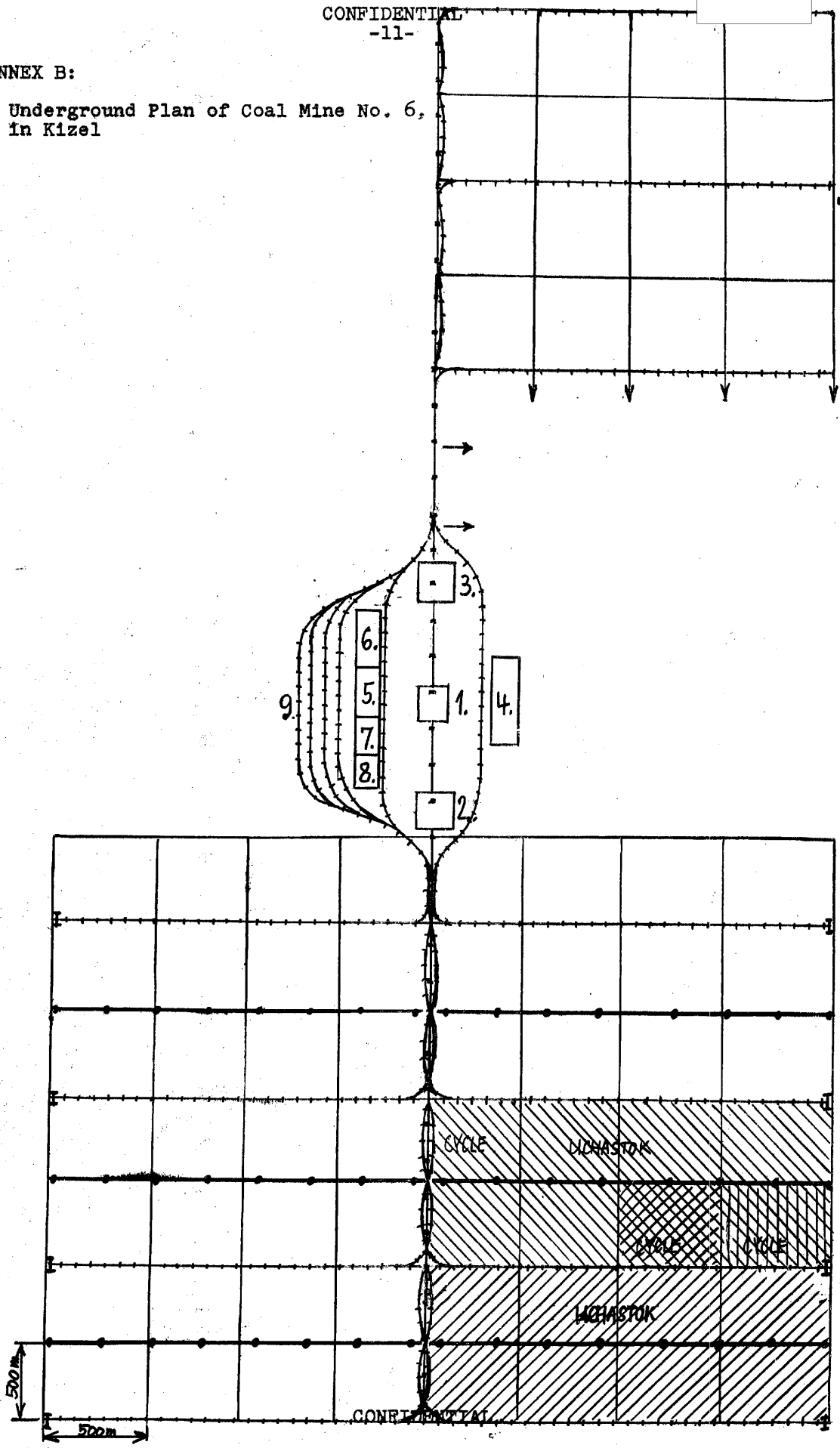
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-11-

ANNEX B:

Underground Plan of Coal Mine No. 6,
in Kizel

"A"

B'






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-12-

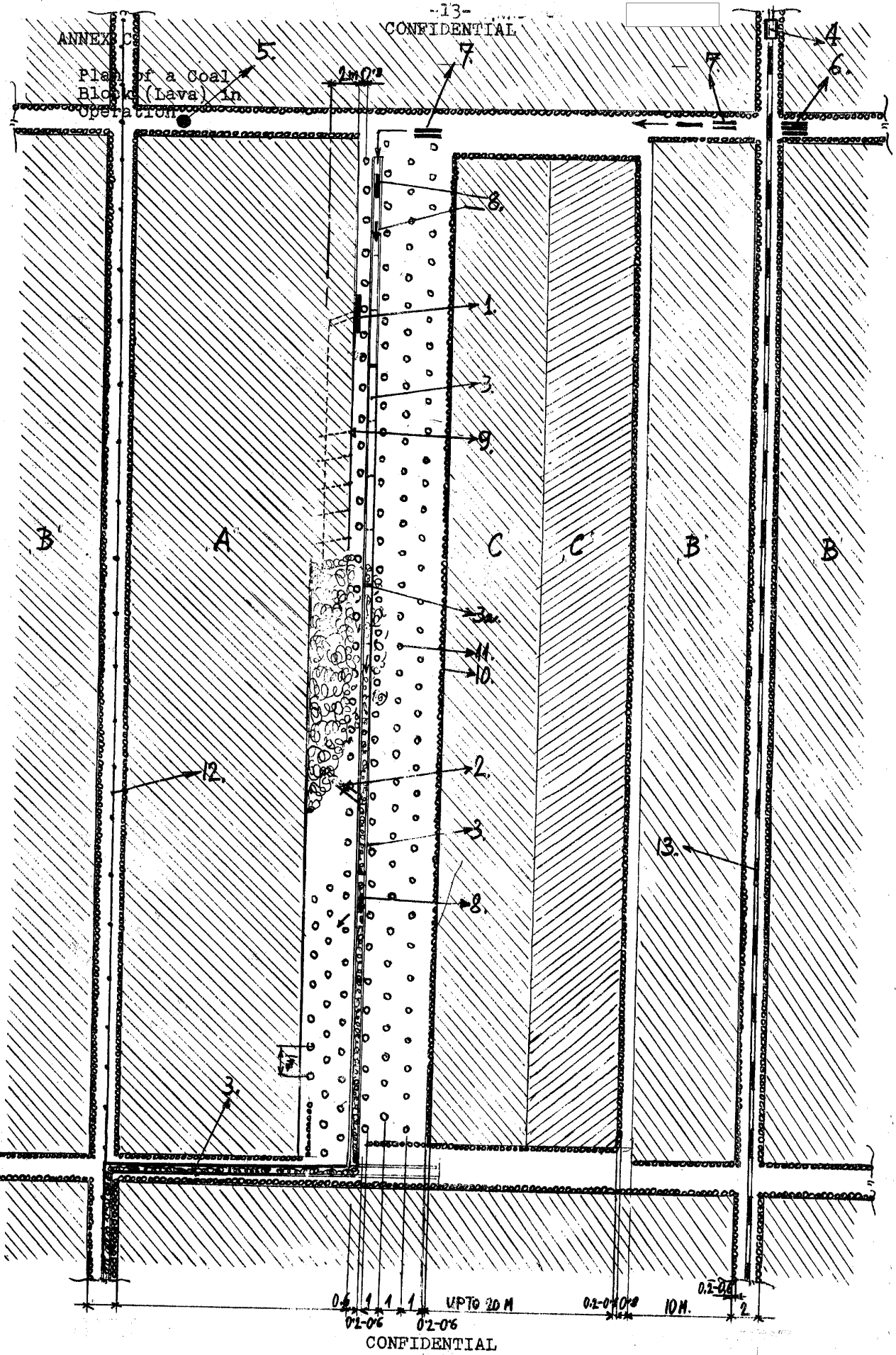
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ANNEX B (Cont'd):

LEGEND

- Pt. A. That part of the mine in operation.
- B. That part of the mine in preparation (responsibility of Shakhtostroy).
1. Elevator for miners.
 2. Coal elevator.
 3. Coal elevator.
 4. Storerooms for explosives equipment / Sklady V.V. (vzryvchatykh veshchestv) i S.V. (sredstv vzryva) /.
 5. Water pump station.
 6. Transformer room.
 7. Ventilating room.
 8. Dispensary.
 9. Electric locomotives depot and railroad car sidings.
-  Double-track railroad lines.
-  Single-track railroad lines.
-  Conveyers.
- I. Winch.

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CONFIDENTIAL

-14-

50X1

ANNEX C (Cont'd):

LEGEND

- A. Working coal face (tsikl), approximately 500 m. long.
- B. Coal faces prepared for work.
- C. Two exploited and abandoned faces.
 1. Coal cutter.
 2. Scraper-transporter.
 3. Shaker.
 - 3a. Shaker motor.
 4. Electric winch lorry for lumber-loaded cars.
 5. Electric winch lorry for unloaded lumber.
 6. Lumber storage (props).
 7. Lumber pulled by winch lorry (see Pt. 5).
 8. Lumber traveling on shakers.
 9. Electric drill.
 10. Supporting pillar-wall.
 11. Rows of props.
 12. Coal transporting conveyer.
 13. Single-track railroad line for lumber cars.

CONFIDENTIAL

-15-
CONFIDENTIAL



50X1

ANNEX D:

Coal Cutter and Electric Drills

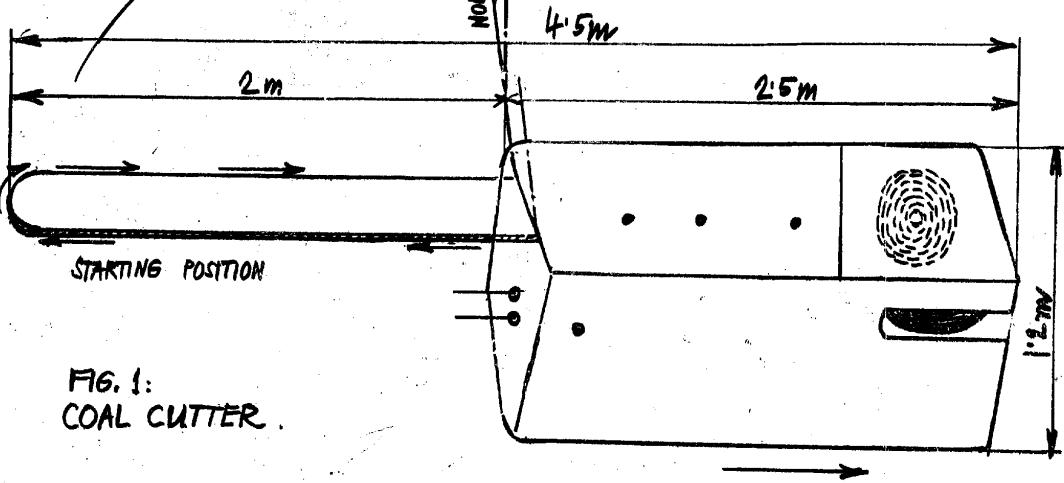


FIG. 1:
COAL CUTTER.

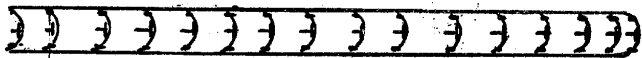


FIG. 2.
CUTTER'S CHAIN WITHOUT BLADE

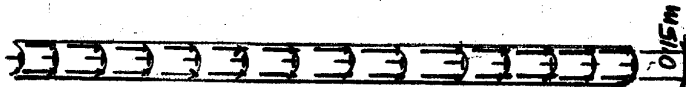


FIG. 3.
CUTTER'S CHAIN WITH BLADE

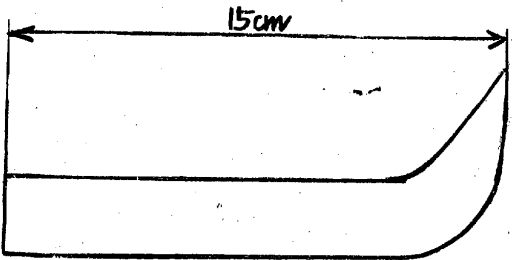


FIG. 4. BLADE.

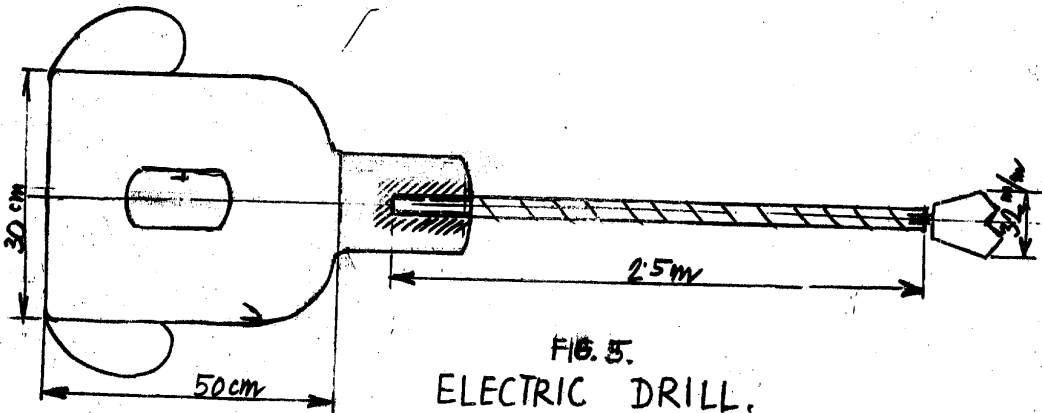


FIG. 5.
ELECTRIC DRILL.
(WEIGHT 16 kg)
IS OPERATED BY TWO MINERS.

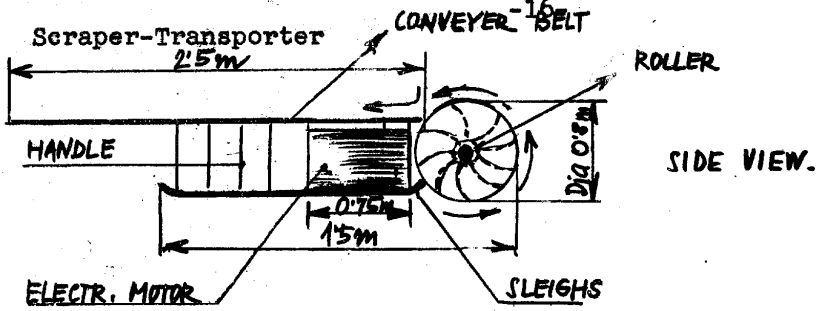
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ANNEX E:

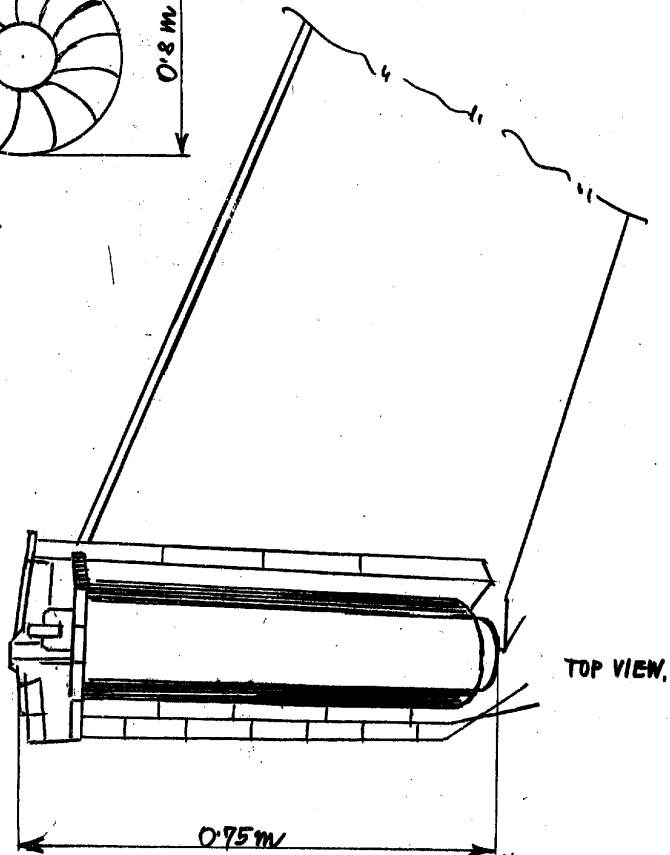
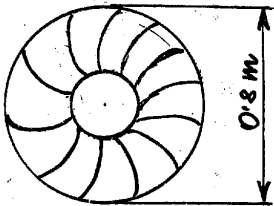
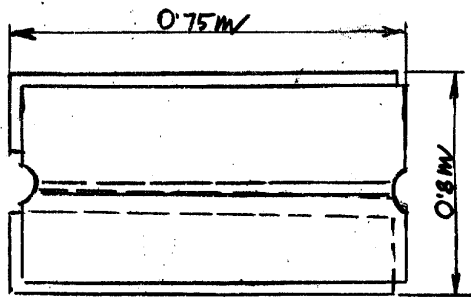
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SCRAPER-TRANSPORTER.



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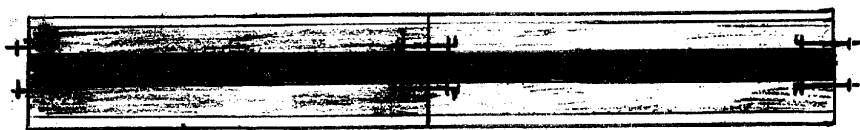
ANNEX F:

CONFIDENTIAL
-17-

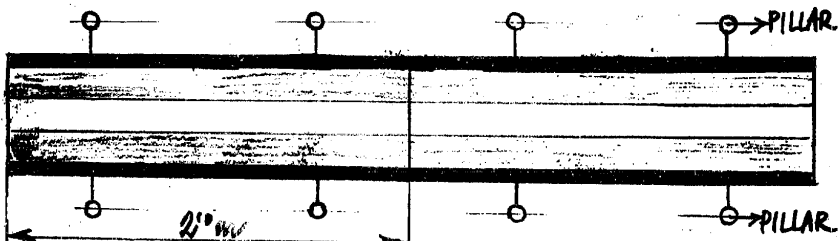
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Shaker

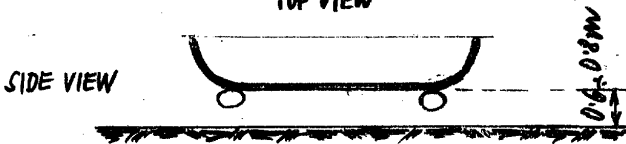
SHAKER,



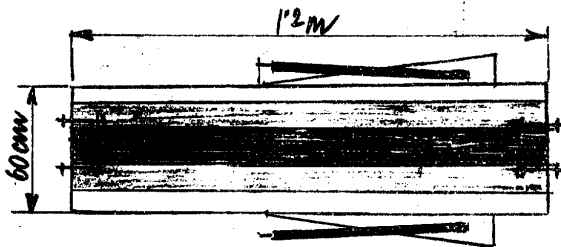
BOTTOM VIEW



TOP VIEW

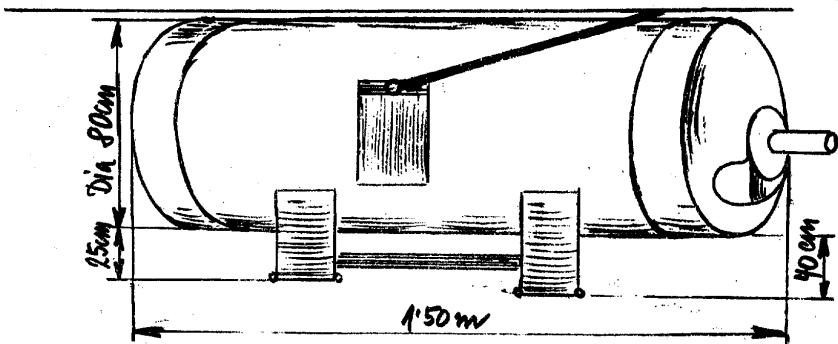


SIDE VIEW



DRIVING SHAKER - BOTTOM VIEW

SHAKER MOTOR - SIDE VIEW



NOTE: ONE MOTOR NORMALLY OPERATED 20 SHAKERS
10 LEFT AND 10 RIGHT OF IT.

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